

1     Improvements relating to Water Treatment Apparatus

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3     The present invention relates to a water treatment  
4     apparatus programmable pass key.

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6     Water treatment apparatus including for example  
7     ultra-pure treatment and filtration apparatus for  
8     laboratory, medical, clinical, research and other  
9     uses, are becoming increasingly sophisticated. Thus  
10    the need to ensure correct operation of such  
11    apparatus also requires to keep in step.

12

13    However, operation of such apparatus is still  
14    commonly accessible by any user whether trained or  
15    untrained. It is increasingly not desired to allow  
16    untrained users to carry out any significant  
17    resetting or re-operation of water treatment  
18    apparatus. This includes such operations as  
19    'sanitisation'.

20

21    Sanitisation of water treatment apparatus is an  
22    important operation, and its incorrect operation,

1     such as conducting the operation too frequently or  
2     too infrequently, or whilst other operations are  
3     ongoing, can lead to significant damage to the  
4     apparatus and/or water product therefrom.

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6     It is an intention of the present invention to  
7     obviate these disadvantages.

8

9     It is also possible to control water treatment  
10    apparatus from more than one access point for either  
11    display and/or control, with these access points  
12    being in separate or different locations. It is  
13    desired to have improved safety levels across the  
14    system to reduce the possibility of errors due to  
15    overlapping control.

16

17    Thus, according to one aspect of the present  
18    invention, there is provided a water treatment  
19    apparatus programmable pass key comprising a data  
20    carrier programmed with one or more predetermined  
21    codes, each code relating to an operation in or of  
22    the water treatment apparatus.

23

24    The pass key could have any suitable size, shape or  
25    design, including the design and style of other  
26    programmable keys such as for tools, cars, computers  
27    or other technical equipment. Generally such keys  
28    are usable with one hand, and are adapted to be  
29    easily storable.

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1 The data carrier may be any form of programmable  
2 data carrier known in the art, generally including a  
3 computer chip or chips.  
4

5 The operation(s) of the water treatment apparatus  
6 include all those known in the art, including any  
7 type of treatment of water, such as filtration,  
8 sanitisation or recirculation, and any type of  
9 reprogramming of the water treatment apparatus to  
10 provide different flow rates, levels of filtration,  
11 etc, as well as servicing operations of the  
12 apparatus.  
13

14 The term "water treatment apparatus" as used herein  
15 includes a complete or stand-alone apparatus, as  
16 well as components or parts or fittings of water  
17 treatment apparatus, such as individual treatment  
18 units or replaceable or consumable parts such as a  
19 resin cartridge, as well as multi-site apparatus  
20 having more than one user or user-operable  
21 interface.  
22

23 The latter apparatus can often be in different rooms  
24 or even buildings, often leading to complications  
25 where different users are using the same apparatus  
26 at the same time, but desiring different operations  
27 therefrom. The pass key of the present invention  
28 ensures that certain operations such as sanitisation  
29 can be limited to one or more authorised users.  
30

31 Multiple access points may be connected across a  
32 network as known in the art, such as via an RS485

1 connection across a Local Area Network (LAN). Each  
2 access point may be individually programmed to have  
3 access to different operations, display screens or  
4 alarms. The access points may be configured to only  
5 allow one controller to be used at any time or may  
6 indicate the location of any network activity.

7  
8 It may further be preferable to limit the location  
9 of activation of certain operations, such as  
10 sanitisation, to certain control points such as the  
11 location of chemical addition or storage.

12  
13 The pass key of the present invention is preferably  
14 separable from the water treatment apparatus, and so  
15 includes an electronic circuit which can co-operate  
16 with an electronic circuit in the host water  
17 treatment apparatus. The co-operation of the pass  
18 key and water treatment apparatus may be one way,  
19 either from the pass key to the apparatus or vice-  
20 versa, or two way.

21  
22 The pass key and the water treatment apparatus can  
23 communicate via any form of transmittable waveform,  
24 analogue or digital, including optical and magnetic  
25 contacts. Preferably these circuits communicate by  
26 physical electrical contact for maximum robustness  
27 and confirmation of connection, and to minimise  
28 interference by other means of communication.  
29 Preferably co-operation of the circuits is only  
30 possible when the communication is correctly  
31 created, and this is only achieved when the pass key

1 is correctly connected, installed and/or fitted with  
2 the host water treatment apparatus.

3

4 Such keys are known in the art, for example from  
5 Dallas Semiconductor Corp. (Dallas TX, USA). Their  
6 key is scanned and the correct type is confirmed  
7 before the serial number stored in the non volatile  
8 memory is checked prior to allowing access to the  
9 functions programmed for that device.

10

11 The pass key preferably includes a memory capacity  
12 and an ability to read/interrogate the water  
13 treatment apparatus, and/or vice versa.

14

15 The pass key may also include a database having  
16 relevant data relating to the water treatment  
17 apparatus such as validation information, process  
18 information, and/or manufacturing information.  
19 Typical information includes, but is not limited to,  
20 date of manufacture, date of the or each servicing  
21 and/or testing and/or other operation, the user,  
22 process parameters and data, quality control  
23 details, and possibly a unique reference code.

24

25 Thus, the present invention extends to a water  
26 treatment apparatus programmable pass key as herein  
27 before defined in combination with a water treatment  
28 apparatus adapted to receive and read the pass key.

29

30 The or each code of the pass key may include an  
31 enablement signal to the water treatment apparatus  
32 which signal may include means for the user to

1 uniquely control one or more different operations of  
2 the water treatment apparatus.

3

4 The pass key or one or more codes in the pass key  
5 may be time-dependent, so as to require renewal or  
6 reactivation after a certain time. The certain time  
7 could be a predetermined time period wherein the  
8 user requires retraining on the water treatment  
9 apparatus, or the apparatus requires different  
10 operations, and the like.

11

12 Different pass keys could be usable on the same  
13 water treatment apparatus, but each pass key could  
14 have a different number and/or type of code  
15 according to different types of access allowed by  
16 types of different users, such as laboratory  
17 personnel and service engineers.

18

19 The pass key of the present invention obviates the  
20 need for pass words or pin numbers commonly used in  
21 the art to gain access through a key board or key  
22 pad to technological apparatus, and can ensure that  
23 only authorised personnel can adjust key operating  
24 parameters, such as alarm conditions, auto-restart,  
25 etc.

26

27 The pass key may also allow access to operational  
28 data such as hours operated, number of stop/starts,  
29 sanitisations and the like.

30

31 The pass key can also instruct that only key  
32 personnel, perhaps those who have only had the

1 appropriate training, can initiate activities such  
2 as system cleaning and sanitisation. As chemicals  
3 or sanitisation agents can be pumped for some  
4 distance through the complete network of pipes and  
5 outlets for some types of water treatment apparatus,  
6 it is an essential safety aspect that only qualified  
7 personnel undertake this activity, and in such a way  
8 as to avoid conflict with simultaneous operators or  
9 users.

10

11 The pass key of the present invention could also  
12 ensure that for an operation such as cleaning and/or  
13 sanitisation, such a process can only proceed upon  
14 presentation of the key. In many present water  
15 treatment apparatus, sanitisation is carried out by  
16 the manual introduction of relevant chemicals as and  
17 when desired, without any ability of the water  
18 treatment apparatus to inhibit any user from  
19 carrying out the operation when unnecessary.

20

21 The cleaning and/or sanitisation process could  
22 include recirculation of the chemicals or sanitants,  
23 reduction of reservoirs levels, discharge to drains,  
24 rinsing with fresh water, all in an automatic  
25 process, such that down time of the apparatus is  
26 minimised due to the use of self-draining reservoirs  
27 with no hideout areas, deadlegs, etc.

28

29 Where there are more than one display or control  
30 stations, the current operation regime can be  
31 displayed and in certain circumstances, such as  
32 during a sanitisation, local operation or control

1     can be inhibited. Alternatively certain operations  
2     may be prevented from initiation by the distant  
3     access point.

4  
5     A further advantage of the present invention is that  
6     it can be time coded, such that after a pre-set  
7     time, possibly installed during programming of the  
8     pass key, it would become inoperable. Thus for  
9     instance, this could be a signal that the pass key  
10    holder must attend ongoing product training at pre-  
11    determined intervals to ensure their knowledge of  
12    the product is kept up to date and their skill codes  
13    revalidated.

14  
15    The present invention extends to a method of  
16    operating a water treatment apparatus, wherein one  
17    or more operations of the water treatment apparatus  
18    are only operable by conjunction of a programmable  
19    pass key as herein before defined with the water  
20    treatment apparatus, said pass key having a or the  
21    code adapted to operate the or each operation.

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